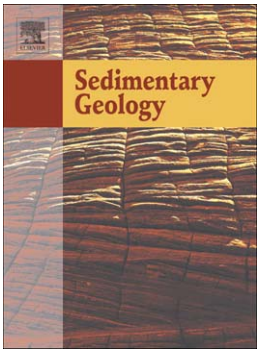

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Jianguo Zhang, Zaixing Jiang, Elizabeth Gierlowski-Kordesch, Benzhong Xian, Zhenpeng Li, Siqi Wang, Xiabin Wang

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A double-cycle lake basin formed in extensional to transtensional setting: the Paleogene Nanpu Sag, Bohai Bay Basin, China

Jianguo Zhang [a, b], Zaixing Jiang [a, *], Elizabeth Gierlowski-Kordesch [b], Benzhong Xian [c, d], Zhenpeng Li [e], Siqi Wang [a], Xiabin Wang [a]

[a] College of Energy, China University of Geosciences, Beijing 100083, China

[b] Department of Geological Sciences, Ohio University, Athens, Ohio 45701, USA

[c] College of Geosciences, China University of Petroleum, Beijing 102249, China

[d] State Key Laboratory of Petroleum Resources and Prospecting, Beijing 102249, China

[e] Tianjin Branch, CNOOC, Tianjin 300452, China

Abstract

It has been known that both extensional and transtensional tectonics commonly trigger a one-cycle evolution of lake sediments, but lake-cycle development co-controlled by extensional and transtensional tectonics still need identification. Here we report a double-cycle of lake sediments formed in extensional to transtensional phases in the Paleogene Nanpu Sag of the Bohai Bay Basin, China. The sag successively experienced five phases of lake-type evolution, characterized by: 1) overfilled, 2) balanced-fill, 3) overfilled, 4) balanced-fill, and 5) overfilled. Extensional tectonics was responsible for the opening of the basin and the initial creation of accommodation (1st through 3rd phase). Next, subsidence increased again through transtensional tectonics